AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1-21 (Cancelled)

22. (Currently amended) An infusion control device for controlling infusion of a liquid in an extracorporeal blood circuit, comprising:

an arterial pipe connected to an inlet of a blood compartment of a filter, the arterial pipe being also connected to a pre-dilution pipe of an infusion circuit;

a venous pipe connected to an outlet of the blood compartment, the venous pipe being also connected to a post-dilution pipe of said infusion circuit; and

a control unit configured to ~~regulate and distribute~~ control the distribution of an infusion flow rate in said arterial and venous pipes based on a monitoring of ~~quantities that are directly~~ at least one quantity correlated with the operating conditions of the filter.

23. (Currently amended) Device according to claim 22, wherein said ~~quantities are~~ quantity is obtained by mathematical methods from measured or imposed quantities.

24. (Currently amended) Device according to claim 22, wherein said ~~quantities comprise~~ quantity comprises a trans-membrane pressure ~~values~~ value.

25. (Currently amended) Device according to claim 24, wherein said trans-membrane pressure ~~values~~ value ~~include~~ includes a mean trans-membrane ~~values~~ value:

$$TMP_{ave} = [TMP_i - TMP_o] / 2$$

calculated from four pressures measured at the inlet and outlet of the blood compartment and at the inlet and outlet of a dialysis liquid compartment of the filter, wherein, TMP_i is the inlet transmembrane pressure value, which is equal to the difference between the pressure value at the inlet of the blood compartment and the pressure value at the outlet of the dialysis liquid compartment, and TMP_o is the outlet transmembrane pressure value, which is equal to the difference between the pressure value at the outlet of the blood compartment and the pressure value at the inlet of the dialysis liquid compartment.

26. (Previously presented) Device according to claim 25, further comprising:

means for measuring the blood pressure values at the inlet and at the outlet of the blood compartment of the filter;

means for measuring the dialysis liquid pressure values at the inlet and at the outlet of the dialysis liquid compartment of the filter;

means for calculating an inlet transmembrane pressure value as the difference between the pressure value at the inlet of the blood compartment and the pressure value at the outlet of the dialysis liquid compartment and an outlet transmembrane pressure value as the difference between the pressure value at the outlet of the blood compartment and the pressure value at the inlet of the dialysis liquid compartment; and

means for calculating mean transmembrane pressure value equal to $(TMP_i\text{-}TMP_o)$ /2.

27. (Currently amended) Device according to claim 22, wherein said ~~quantities comprise quantities that are~~ quantity comprises a quantity correlated with the concentration of the blood.

28. (Currently amended) Device according to claim 22, wherein said ~~quantities comprise filtration factors~~ quantity comprises a filtration factor determined on the basis of:

$$FF = UFR/Q_p = UFR/[Q_b \bullet (1\text{-}Hct)]$$

in which UFR is the ultrafiltration flow rate, Q_p is the plasma flow, Q_b is the blood flow, and Hct is the hematocrit.

29. (Previously presented) Device according to claim 28, further comprising:

means for determining an ultrafiltration flow rate of plasma water through the membrane of the filter;

means for determining the hematocrit at the inlet of the filter, and

means for calculating a filtration factor equal to $UFR/[Q_b (1\text{-}Hct)]$.

30. (Previously presented) Device according to claim 29, wherein the means for determining the hematocrit comprise means for determining the hemoglobin concentration at the inlet of the filter and means for dividing the hemoglobin concentration by a constant coefficient.

31. (Currently amended) Device according to claim 22, wherein said ~~quantities comprise~~ quantity comprises an actual permeability of a membrane of the filter.

32. (Previously presented) Device according to claim 31, further comprising:

means for determining an ultrafiltration flow rate of plasma water through the membrane of the filter; and

means for calculating an actual permeability equal to the ratio between the ultrafiltration flow rate and the mean transmembrane pressure value.

33. (Currently amended) An infusion control device for controlling infusion of a liquid in an extracorporeal blood circuit, comprising:

an arterial pipe connected to an inlet of a blood compartment of a filter, the arterial pipe being also connected to a pre-dilution pipe of an infusion circuit;

a venous pipe connected to an outlet of the blood compartment, the venous pipe being also connected to a post-dilution pipe of said infusion circuit; and

a controller configured to regulate the distribution of the flow rates in said ~~two~~ pre-dilution and post-dilution pipes from at least one quantity correlated with the concentration of the blood and/or with the filtration efficiency of the filter.

34. (Previously presented) Device according to claim 33, further comprising a valve means for alternately occluding the pre-dilution pipe and the post-dilution pipe.

35. (Previously presented) Device according to claim 33, further comprising at least one infusion pump for circulating an infusion liquid in said pre-dilution and post-dilution pipes.

36. (Currently amended) Device according to claim 33, wherein said at least one quantity comprises at least one selected ~~in~~ from the group including:

a filtration factor determined on the basis of:

$FF = UFR/Q_p = UFR/[\ Q_b \bullet (1\text{-}Hct)]$

in which UFR is the ultrafiltration flow rate, Q_p is the plasma flow, O_b is the blood flow and Hct is the hematocrit,

an actual permeability of a membrane of the filter, ~~and~~

a trans-membrane pressure of a membrane of the filter,

hematocrit,

hemoglobin,

blood viscosity,

blood electrical conductivity,

blood density, and

blood concentration.

37. (Currently amended) Device according to claim 36, further comprising:

means for measuring the blood pressure values at the inlet and at the outlet of the blood compartment of the filter;

means for measuring the dialysis liquid pressure values at the inlet and at the outlet of a dialysis liquid compartment of the filter;

means for calculating an inlet transmembrane pressure value as the difference between the pressure value TMP_i at the inlet of the blood compartment and the pressure value at the outlet of the dialysis liquid compartment, and an outlet transmembrane pressure value TMP_o as the difference between the pressure value at the outlet of the blood compartment and the pressure value at the inlet of the dialysis liquid compartment; and

means for calculating a transmembrane pressure value equal to $(TMP_i - TMP_o)/2$.

38. (Previously presented) Device according to claim 36, further comprising:

means for determining an ultrafiltration flow rate of plasma water through the membrane of the filter;

means for determining the hematocrit at the inlet of the filter; and

means for calculating a filtration factor.

39. (Previously presented) Device according to claim 38, wherein the means for determining the hematocrit comprises means for determining the hemoglobin concentration at the inlet of the filter and means for dividing the hemoglobin concentration by a constant coefficient.

40. (Previously presented) Device according to claim 36, further comprising:

means for determining an ultrafiltration flow rate of plasma water through the membrane of the filter; and

means for calculating an actual permeability equal to the ratio between the ultrafiltration flow rate and the mean transmembrane pressure value.

41. (Currently amended) An infusion control device for controlling infusion of a liquid in an extracorporeal blood circuit, comprising:

an arterial pipe connected to an inlet of a blood compartment of a filter, the arterial pipe being also connected to a pre-dilution pipe of an infusion circuit;

a venous pipe connected to an outlet of the blood compartment, the venous pipe being also connected to a post-dilution pipe of said infusion circuit;

~~sensors~~ at least one sensor able to emit signals correlated to at least one quantity correlated with the concentration of the blood and/or with the filtration efficiency of the filter; and

a control unit able to receive said signals and to regulate the distribution of an infusion flow ~~rates~~ rate in the pre-dilution pipe and in the post-dilution pipe on the basis of said signals.

42. (Currently amended) Device according to claim 41, wherein said ~~sensors are~~ sensor is selected from the group including: ~~haemoconcentration~~ hemoconcentration sensors, blood viscosity measuring devices, blood electrical conductivity measuring devices, blood density measuring devices, blood pressure sensors, and dialysis liquid pressure sensors.

43. (Previously presented) Blood treatment machine comprising an infusion control device according to claim 22.

44. (Previously presented) Blood treatment machine comprising an infusion control device according to claim 33.

45. (Previously presented) Blood treatment machine comprising an infusion control device according to claim 41.

46. (Currently amended) Method for infusing a liquid in an extracorporeal blood circuit, the extracorporeal blood circuit having an arterial pipe connected to an inlet of a blood compartment of a filter and a venous pipe connected to an outlet of the blood compartment, the method comprising:

determining ~~the~~ a distribution of an infusion flow ~~rates~~ rate of the liquid to infuse in the arterial pipe and in the venous pipe from at least one quantity correlated with the concentration of the blood and/or with a filtration efficiency of the filter, and

infusing the liquid in the arterial pipe and in the venous pipe in accordance with the determined distribution of the infusion flow ~~rates~~ rate.

47. (Currently amended) Method according to claim 46, wherein said quantity comprises at least one of:

a filtration factor determined on the basis of:

$FF = UFR/Q_p = UFR/[Qp \bullet (1\text{-}Hct)]$

in which UFR is the ultrafiltration flow rate, Q_p is the plasma flow, Q_b is the blood flow, and Hct is the hematocrit,

an actual permeability of a membrane of the filter, and

a trans-membrane pressure of a membrane of the filter,

hematocrit,

hemoglobin,

blood viscosity,

blood electrical conductivity,

blood density, and

blood concentration.

Claims 48-49 (Cancelled)

50. (New) Method for infusing a liquid in an extracorporeal blood circuit, the extracorporeal blood circuit having an arterial pipe connected to an inlet of a blood compartment of a filter and a venous pipe connected to an outlet of the blood compartment, the method comprising:

determining the infusion flow rates of the liquid to infuse in the arterial pipe and in the venous pipe from at least one quantity selected from the group including: filtration factor of a membrane of the filter, actual permeability of a membrane of the filter, trans-membrane pressure of a membrane of the filter, hematocrit, hemoglobin,

blood viscosity, blood electrical conductivity, blood density, and blood concentration; and

infusing the liquid in the arterial pipe and in the venous pipe in accordance with the determined infusion flow rates.

51. (New) An infusion control device for controlling infusion of a liquid in an extracorporeal blood circuit, comprising:

an infusion circuit comprising:

a pre-dilution pipe to infuse a liquid in the extracorporeal blood circuit upstream of a filter; and

a post-dilution pipe to infuse a liquid in the extracorporeal blood circuit downstream of the filter;

a control unit configured to determine at least one of a flow rate in said pre-dilution pipe and a flow rate in said post-dilution pipe from at least one quantity selected from the group including:

filtration factor of a membrane of the filter, actual permeability of a membrane of the filter, trans-membrane pressure of a membrane of the filter, hematocrit, hemoglobin, blood viscosity, blood electrical conductivity, blood density, and blood concentration.

52. (New) An infusion control device for controlling infusion of a liquid in an extracorporeal blood circuit, comprising:

an infusion circuit comprising:

a pre-dilution pipe to infuse a liquid in the extracorporeal blood circuit upstream of a filter; and

a post-dilution pipe to infuse a liquid in the extracorporeal blood circuit downstream of the filter;

a controller configured to regulate the flow rates in said pre-dilution and post-dilution pipes from at least one quantity selected in the group including:

filtration factor of a membrane of the filter, actual permeability of a membrane of the filter, trans-membrane pressure of a membrane of the filter, hematocrit, hemoglobin, blood viscosity, blood electrical conductivity, blood density, and blood concentration.

53. (New) A blood treatment apparatus comprising:

a filter having a blood compartment and a liquid compartment separated by a semi-permeable membrane;

an arterial pipe connected to an inlet of said blood compartment;

a venous pipe connected to an outlet of said blood compartment;

a drain pipe connected to an outlet of said liquid compartment;

an infusion circuit having a pre-dilution pipe connected to said arterial pipe and a post-dilution pipe connected to said venous pipe;

a control unit configured to control one or more quantities correlated with the operating conditions of the filter by varying a distribution of an infusion flow rate in said pre-dilution and post-dilution pipes.

54. (New) Apparatus according to claim 51, wherein said one or more quantities are selected from the group including:

hematocrit; hemoglobin; blood viscosity; blood electrical conductivity; blood density; blood concentration; filtration factor of a membrane of the filter; actual

permeability of a membrane of the filter; and trans-membrane pressure of a membrane of the filter.

55. (New) A blood treatment apparatus comprising:

a filter having a blood compartment and a liquid compartment separated by a semi-permeable membrane;

an arterial pipe connected to an inlet of said blood compartment;

a venous pipe connected to an outlet of said blood compartment;

a drain pipe connected to an outlet of said liquid compartmnet;

an infusion circuit having a pre-dilution pipe connected to said arterial pipe and a post-dilution pipe connected to said venous pipe;

a control unit configured to regulate a distribution of an infusion flow rate in said pre-dilution and post-dilution pipes based on a monitoring of at least one quantity correlated with the operating conditions of the filter.

56. (New) Apparatus according to claim 53, wherein said at least one quantity is selected from the group including:

hematocrit; hemoglobin; blood viscosity; blood electrical conductivity; blood density; blood concentration; filtration factor of a membrane of the filter; actual permeability of a membrane of t he filter; and trans-membrane pressure of a membrane of the filter.

57. (New) A blood treatment apparatus comprising:

a filter having a blood compartment and a liquid compartment separated by a semi-permeable membrane;

an arterial pipe connected to an inlet of said blood compartment;

a venous pipe connected to an outlet of said blood compartment;

a drain pipe connected to an outlet of said liquid compartment;

an infusion circuit having a pre-dilution pipe connected to said arterial pipe and a post-dilution pipe connected to said venous pipe;

a control unit configured to regulate at least one of a flow rate in said pre-dilution pipe and a flow rate in said post-dilution pipe based on a monitoring of at least one quantity selected from the group including:

hematocrit; hemoglobin; blood viscosity; blood electrical conductivity; blood density; blood concentration; filtration factor of a membrane of the filter; actual permeability of a membrane of the filter; and trans-membrane pressure of a membrane of the filter.

58. (New) A blood treatment apparatus comprising:

a filter having a blood compartment and a liquid compartment separated by a semi-permeable membrane;

an arterial pipe connected to an inlet of said blood compartment;

a venous pipe connected to an outlet of said blood compartment;

a drain pipe connected to an outlet of said liquid compartment;

an infusion circuit having a pre-dilution pipe connected to said arterial pipe and a post-dilution pipe connected to said venous pipe;

a control unit configured to control one or more quantities correlated with the operating conditions of the filter by varying at least one of a flow rate in said pre-dilution pipe and a f low rate in said post-dilution pipe.

59. (New) A blood treatment apparatus comprising:

a filter having a blood compartment and a liquid compartment separated by a semi-permeable membrane;

an arterial pipe connected to an inlet of said blood compartment;

a venous pipe connected to an outlet of said blood compartment;

a drain pipe connected to an outlet of said liquid compartment;

an infusion circuit having a pre-dilution pipe connected to said arterial pipe and a post-dilution pipe connected to said venous pipe;

a control unit configured to control at least one of:

hematocrit; hemoglobin; blood viscosity; blood electrical conductivity; blood density; blood concentration; filtration factor of a membrane of the filter; actual permeability of a membrane of the filter; trans-membrane pressure of a membrane of the filter;

by regulating at least one of the infusion flow rate in said pre-dilution pipe and an infusion flow rate in said post-dilution pipe.